

IN THE CLAIMS

Claim 1 (currently amended). A process for the thermal decoking of a zeolite catalyst used for producing lower olefins, ~~preferably C₂ and C₃ olefins~~, from a mixture of higher olefins, ~~preferably C₄ to C₈ olefins~~, or from methanol or from dimethyl ether in a reactor (1) ~~with~~ having a bed of granular, form-selective zeolite catalyst (2) ~~on the basis of crystalline, comprised of~~ pentasil-type aluminosilicates, ~~characterized in that in a preliminary stage wherein, in a first step~~ the reactor (1) is rinsed with a nitrogen stream heated to an entrance temperature of 460 to 500°C ~~for expelling to expel~~ the hydrocarbons from the zeolite catalyst, the nitrogen stream, loaded with hydrocarbons, is discharged from the reactor, ~~and, in a second step by means of~~ a nitrogen stream heated to ~~an entrance a~~ temperature of 420 to < 460°C is introduced into and passed through the reactor ~~is cooled correspondingly to cool it to a temperature in the range of 420 to < 460°C, that in a main stage in a third step~~ a nitrogen/air mixture is introduced into and passed the reactor, and slowly gradually heated to ~~an entrance reach a~~ temperature at the point where it enters the reactor of 460 to 500°C ~~flows through the reactor and continued flowing through the reactor~~ until the zeolite catalyst is completely decoked, and then, in a fourth step that in a succeeding stage, the reactor is rinsed with a nitrogen stream heated to an entrance temperature of 460 to 500°C ~~for rinsing out to~~ rinse air from the zeolite catalyst.

Claim 2 (currently amended). The process as claimed in claim 1, ~~characterized in that wherein~~ the nitrogen/air mixture contains up to 75 vol.-%, ~~preferably 40 to 60 vol-%~~ steam.

Claim 3 (currently amended). The process as claimed in ~~any of claims~~ claim 1 ~~to or 2, characterized in that in the preliminary stage wherein, in said first step~~, the reactor (1) is rinsed with nitrogen for 8 to 16 hours.

Claim 4 (currently amended). The process as claimed in ~~any of claims 1 to 3~~
claim 1 or 2, characterized in that in the preliminary stage wherein, in
said second step, the reactor (1) is cooled with nitrogen for 1 to 8 hours.

Claim 5 (currently amended). The process as claimed in ~~any of claims 1 to 4~~
claim 1 or 2, characterized in that in the main stage a wherein, in said
third step said nitrogen/air mixture is heated in several process steps of 5 to
20°C each in over a period of 0.5 to 1.0 hours each ~~flows through the reactor~~
(4), and the entrance temperature per for each of said process steps is kept
constant for ~~8 to 16 hours, preferably for 8 to 12 hours, possibly for up to~~
24 hours.

Claim 6 (currently amended). The process as claimed in ~~any of claims 1 to 5~~
claim 1 or 2, wherein the air content of said nitrogen/air mixture of said
third step is initially, ~~characterized in that with proceeding decoking the~~
~~air content of the nitrogen/air mixture of~~ 2 to 10 vol-%, and is raised up to
50 vol-%, at least ~~in the last process step~~ as the decoking reaches
completion.

Claim 7 (currently amended). The process as claimed in ~~any of claims 1 to 6~~
claim 1 or 2, characterized in that wherein the nitrogen stream loaded with
hydrocarbons, which is discharged from the reactor (1), is supplied to a
thermal treatment.

Claim 8 (currently amended). The process as claimed in ~~any of claims 1 to 7~~
claim 1 or 2, characterized in that wherein the nitrogen stream used for
cooling, ~~which~~ is discharged from the reactor (1), and is released to the
atmosphere or recirculated to the cycle.

Claim 9 (currently amended). The process as claimed in ~~any of claims 1 to 8~~
claim 1 or 2, characterized in that the larger wherein the greater amount
of the nitrogen/air mixture discharged from the reactor (1) is recirculated to the
reactor and the ~~smaller amount~~ remainder is discharged to the atmosphere.

Claim 10 (currently amended). An apparatus for performing the process as claimed in ~~any of claims 1 to 9~~ claim 1 or 2, ~~characterized by~~ comprising a heater (6) used for heating the nitrogen streams and the nitrogen/air stream, a succeeding reactor (1), a succeeding dust separator (10), a succeeding air cooler (12), and a succeeding compressor (14).

Claim 11 (currently amended). The apparatus as claimed in claim 10, ~~characterized by~~ comprising a heat exchanger (4) disposed before the heater (1).

Claim 12 (new). The process of claim 1, wherein said lower olefins are C₂ and C₃ olefins and said higher olefins are C₄ to C₈ olefins.

Claim 13 (new). The process of claim 2, wherein said amount of steam is 40 to 60 vol.%.

Claim 14 (new). The process of claim 5, wherein said entrance temperature is kept constant for 8 to 16 hours.

Claim 15 (new). The process of claim 14, wherein said entrance temperature is kept constant for 8 to 12 hours.